

CLAIMS:

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1. A closure suitable for mounting onto a container, the container having an opening defined by an end portion of the container, the closure including a top portion and a skirt portion depending from the top portion, an annular sealing rib projecting downwardly from an underside of the top portion, the rib including a first portion which is contiguous with the top portion and having an inner surface, which inner surface lies radially inwardly of the skirt portion and at least a second, frusto-conical, portion contiguous with the first portion and separated from the top portion by the inner surface of the first portion, the second portion having an upper side and an underside and extending radially inwardly to a circular edge, the inner surface of the first portion having an internal diameter relative to the external diameter of the end portion of the container to which the closure is to be attached such that during attachment of the closure with the end portion of the container, the sealing rib will be engaged by said end portion of the container so folding the second portion at least towards the inner surface of the first portion of the rib to form a seal between at least an outer surface of the end portion of the container and the closure, the closure being characterised in that there is an annular protrusion formed on the underside of the second portion and extending outwardly therefrom, the protrusion on attachment of the closure with the end portion engages the outer surface of the end portion so causing the sealing rib to be disposed over a greater area of the outer surface of the end portion of the container.

2. The closure of claim 1 wherein the annular protrusion comprises an annular ridge extending outwardly to a peak.

3. The closure of claim 2 wherein the ridge is substantially triangular in cross-section.

4. The closure of claim 3 wherein one surface of the ridge comprises an end portion engaging surface that acts to extend the area of the seal between the second portion and the container end portion on attachment of the closure to the container.

5. The closure of any one of the preceding claims wherein the annular protrusion is positioned about midway between the first portion and the circular edge of the second portion.

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6. The closure of any one of claims 1 to 4 wherein the annular protrusion is positioned closer to the first position than the circular free edge of the second portion.

7. The closure of any one of the preceding claims wherein the annular protrusion has a resiliently flexible member extending outwardly from or adjacent the peak of the annular ridge, the resiliently flexible member serving to extend the area of the seal between the second portion and the container end portion on attachment of the closure to the container.

8. The closure of claim 7 wherein the resiliently flexible member extends downwardly and inwardly from the peak of the annular protrusion prior to attachment of the closure to the container end portion.

9. The closure of claim 7 or claim 8 wherein the resiliently flexible member tapers in thickness as it extends away from the second portion of the sealing rib.

10. The closure of any one of the preceding claims wherein a screw thread is provided on an inside surface of the skirt portion that is adapted to engage with a corresponding thread on the outer surface of the end portion of the container.

11. The closure of any one of the preceding claims wherein the first portion of the rib comprises a thickening of the skirt portion in the region adjacent the skirt's connection to the top portion.

12. The closure of any one of claims 1 to 10 wherein the first portion of the sealing rib is formed radially inwardly of the skirt portion with an annular space therebetween.

13. The closure of any one of the preceding claims wherein the inner surface of the first portion is substantially cylindrical.

14. The closure of any one of claims 1 to 12 wherein the first portion of the rib has a thickness that increases as it extends in a direction away from the top portion of the closure.

15. The closure of any one of the preceding claims wherein the sealing rib includes a third portion connected to the second portion at or adjacent the circular edge of the second portion and, prior to attachment of the closure to the container, extending generally axially away from the top portion to a distal end, the third portion being substantially no thicker than the second portion and having a length longer than its thickness.

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16. The closure of any one of the preceding claims wherein the closure is made from polyethylene.

17. The closure of any one of the preceding claims wherein the closure is formed in one piece.

5 18. The closure of any one of the preceding claims wherein the closure has a tamper evident band adapted to provide an indication of removal or attempted removal of the closure from a container.

19. The closure of claims 18 wherein the tamper evident band extends from the skirt portion by connection through a plurality of frangible bridges.

10 20. The closure of claim 18 or claim 19 wherein as the closure is removed from a container, the tamper evident band provides an indication of this removal either before or as the second portion of the sealing rib disengages with at least the outer surface of the end portion of the container.

15 21. The closure of any one of the preceding claims wherein an underside of the top portion of the closure has an engagement means comprising a continuous or segmented annular ridge radially inside of the sealing rib.

22. The closure of claim 21 wherein the upper side of the second portion of the rib has a complementary engagement means comprising a continuous or segmented annular ridge and wherein, on attachment of the closure with the end portion, the complementary engagement means are adapted to interlock thereby holding the sealing rib touching the underside of the top portion stationary and causing the second portion of the sealing rib to be disposed over a still greater area of the underside of the top portion as well as the outer surface of the end portion.

25 23. The closure of any one of the preceding claims wherein at the line of meeting of the first and second portions of the sealing rib, a weakened zone or annular region of weakness is provided to assist even deformation of the second portion relative to the first as the closure is attached to the end portion of the container.

30 24. A mould for forming a closure as defined in any one of the preceding claims.

25. A container having an opening defined by an end portion of the container, the end portion being sealed by a closure according to any one of claims 1 to 23.

35 26. The container of claim 25 wherein the container is used in an aseptic or hot fill process.

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27. A method of forming a closure as defined in any one of claims 1 to 23, the method comprising the step of moulding a synthetic plastics material in a mould.

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28. The method of forming a closure as defined in claim 27 comprising the step of injection moulding the synthetic plastics materials in the mould.

~~29. A method of applying a closure as defined in any of claims 1 to 23 to an end portion of a container, the method comprising the step of turning the closure onto the end portion of the container until the closure seals the container.~~

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ADD ^{7/2} ABSTRACT > on separate sheet